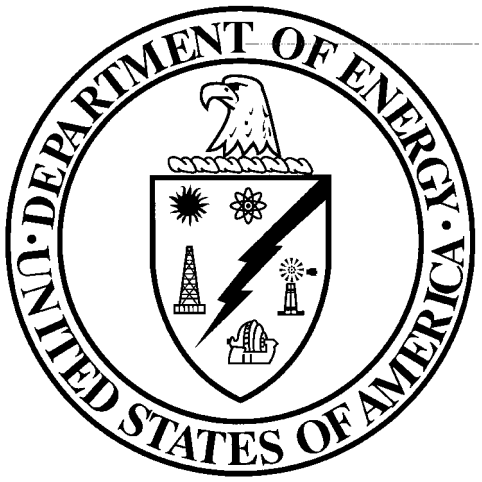
U.S. DEPARTMENT OF ENERGY
DEPARTMENT-WIDE
FUNCTIONAL AREA QUALIFICATION STANDARD

ENVIRONMENTAL COMPLIANCE QUALIFICATION STANDARD

Defense Nuclear Facilities Technical Personnel



U.S. Department of Energy
Washington, D.C. 20585

May 1995

Approval and Concurrence

The Assistant Secretary for Environmental Management is the Management Sponsor for the Department-wide Environmental Restoration Functional Area Qualification Standard. The Management Sponsor is responsible for reviewing the Qualification Standard to ensure that the technical content is accurate and adequate for Department-wide application. The Management Sponsor, in coordination with the Human Resources organization, is also responsible for ensuring that the Qualification Standard is maintained current. Concurrence with this Qualification Standard by the Assistant Secretary for Environmental Management is indicated by the signature below.

The Technical Personnel Program Coordinator (TPPC) is responsible for coordinating the consistent development and implementation of the Technical Qualification Program throughout the Department of Energy. Concurrence with this Qualification Standard by the Technical Personnel Program Coordinator is indicated by the signature below.

The Technical Excellence Executive Committee (TEEC) consists of senior Department of Energy Managers. This Committee is responsible for reviewing and approving the Qualification Standard for Department-wide application. Approval of this Qualification Standard by the Technical Excellence Executive Committee is indicated by the signature below.

NOTE: The signatures below reflect concurrence and approval of this Qualification Standard for interim Implementation. Final concurrence and approval will occur in December 1995, pending comments received based upon implementation.

CONCURRENCE:

Assistant Secretary for Environmental Management	Technical Personnel Program Coordinator

APPROVAL:

Chairman
Technical Excellence Executive Committee

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U.S. DEPARTMENT OF ENERGY
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FUNCTIONAL AREA

Environmental Compliance

PURPOSE

The Technical Qualification Program is divided into three levels of technical competence and qualification. The General Technical Base Qualification Standard establishes the base technical competence required of all Department of Energy defense nuclear facility technical personnel. The Functional Area Qualification Standards build on the requirements of the General Technical Base Qualification Standard and establish Department-wide functional competence requirements in each of the identified functional areas. Office/facility-specific qualification standards establish unique operational competency requirements at the Headquarters or Field element, site, or facility level.

The Environmental Compliance Functional Area Qualification Standard establishes common functional area competency requirements for all Department of Energy environmental compliance technical personnel who provide management oversight or direction impacting the safe operation of defense nuclear facilities. Satisfactory and documented completion of the competency requirements contained in this Standard ensures that technical employees possess the minimum requisite competence to fulfill their functional area duties and responsibilities. Additionally, these competency requirements provide the functional foundation to assure successful completion of the appropriate Office/facility-specific qualification standard.

APPLICABILITY

This Standard applies to all Department of Energy environmental compliance technical personnel who provide management direction or oversight impacting the safe operation of defense nuclear facilities. Personnel designated by Headquarters or Field element line management as participants in the Technical Qualification Program are required to meet the requirements of this Standard as defined in DOE Order 3410, Training.

IMPLEMENTATION REQUIREMENTS

The competencies contained in the Standard are divided into the following four categories:

1. General Technical
2. Regulatory
3. Administrative
4. Management, Assessment, and Oversight

Each of the categories is defined by one or more competency statements indicated by bold print. The competency statements define the expected knowledge and/or skill that an individual must possess, and are requirements. Each competency statement is further explained by a listing of

supporting knowledge and/or skill statements. The supporting knowledge and/or skill statements are not requirements and do not necessarily have to be fulfilled to meet the intent of the competency.

The competencies identify a familiarity level, working level, or expert level of knowledge; or they require the individual to demonstrate the ability to perform a task or activity. These levels are defined as follows:

> **Familiarity level** is defined as basic knowledge of or exposure to the subject or process adequate to discuss the subject or process with individuals of greater knowledge.
>
> **Working level** is defined as the knowledge required to monitor and assess operations/activities, to apply standards of acceptable performance, and to reference appropriate materials and/or expert advice as required to ensure the safety of Departmental activities.
>
> **Expert level** is defined as a comprehensive, intensive knowledge of the subject or process sufficient to provide advice in the absence of procedural guidance.
>
> **Demonstrate the ability** is defined as the actual performance of a task or activity in accordance with policy, procedures, guidelines, and/or accepted industry or Department practices.

Headquarters and Field elements shall establish a program and process to ensure that all defense nuclear facility technical personnel required to participate in the Technical Qualification Program meet the competency requirements contained in this Standard. Documentation of the completion of the requirements of this Standard shall be included in the employee's training and qualification record.

In select cases, it may be necessary to exempt an individual from completing one or more of the competencies in this Functional Area Qualification Standard. Exemptions from individual competencies shall be justified and documented in accordance with DOE Order 3410. Exemptions shall be requested by the individual's immediate supervisor, and approved one level above the individual's immediate supervisor.

Equivalencies may be granted for individual competencies based upon an objective evaluation of the employee's prior education, experience, and/or training. Documentation of equivalencies shall indicate how the competency requirements have been met. The supporting knowledge and/or skill statements may be considered when evaluating an individual's ability with respect to each competency requirement.

Training shall be provided to employees in the Technical Qualification Program who do not meet the competencies contained in the qualification standard. Departmental training will be based upon supporting knowledge and/or skill statements similar to the ones listed for each of the competency statements. Headquarters and Field elements should use the supporting knowledge and/or skill statements as a basis for evaluating the content of any training courses used to provide individuals with the requisite knowledge and/or skill required to meet the qualification standard competency statements.

DUTIES AND RESPONSIBILITIES

The following are duties and responsibilities normally expected of defense nuclear facility technical personnel assigned to the environmental compliance functional area:

A. Serve as a Department of Energy technical point-of-contact and subject matter expert for selected/assigned areas of environmental compliance.

B. Identify, interpret and evaluate the impact of proposed, new and existing environmental laws and regulations for selected/assigned areas as they apply to the Department of Energy and contractor staff and operations.

C. Maintain effective communication with Headquarters, Field elements, Management & Operating contractors, regulatory agencies, the public, and other stakeholders.

D. Evaluate environmental compliance activities and contractor performance to ensure the adequacy and effectiveness of:

- Technical performance
- Plans, policies and procedures
- Management controls
- Regulatory compliance
- Worker and public health/safety programs
- Environmental protection
- Environmental monitoring
- Quality assurance programs
- Pollution prevention
- Waste minimization

E. Conduct evaluations and recommend improvements in environmental compliance practices and procedures.

F. Resolve or facilitate the resolution of environmental compliance issues.

G. Develop, review, and assess environmental compliance documentation and ensure timely submittal of reports.

H. Develop, manage, and negotiate memoranda of understanding, compliance/regulatory agreements and permits.

I. Support the development, implementation, and evaluation of strategic, baseline, project, and program plans for environmental compliance.

J. Monitor and assess overall response and notifications for environmental spills/releases.

Additional duties and responsibilities specific to the site, facility, operational activities, and/or other involved organizations shall be contained in the facility-specific qualification standard(s).

BACKGROUND AND EXPERIENCE

The U. S. Office of Personnel Management's Qualification Standards Handbook establishes minimum education, training, experience, or other relevant requirements applicable to a particular occupational series/grade level, as well as alternatives to meeting specified requirements.

The preferred education and experience for nuclear safety system personnel is:

1. Education:

   Bachelor of Science degree in Engineering, Physical Science, Biological Sciences or a related discipline; or meeting the alternative requirements specified in the Qualifications Standards Handbook.

2. Experience:

   Specialized experience in implementing water and air quality management programs, applying environmental laws and regulations, and/or developing license and permit documentation.

   Specialized experience may be demonstrated through possession of the competencies outlined in this standard.

REQUIRED COMPETENCIES

The competencies contained in this Standard are distinct from those competencies contained in the General Technical Base Qualification Standard. All environmental compliance personnel must complete the competency requirements of the General Technical Base Qualification Standard prior to or in parallel with the completion of the competency requirements contained in this Standard. Each of the competency statements defines the level of expected knowledge and/or skill that an individual is required to possess to meet the intent of this Standard. The supporting knowledge and/or skill statements further describe the intent of the competency statements but are not requirements.

1. GENERAL TECHNICAL

1.1 Environmental compliance personnel shall demonstrate a familiarity level knowledge of chemistry theory and the periodic table.

Supporting Knowledge and/or Skills

a. Describe the four states of matter.

b. Explain the structure of an atom.

c. Discuss the following terms:

- Element
- Molecule
- Avogadro's number
- Mole

d. Given a periodic table, identify and explain the significance of the arrangement of elements, to include the following:

- Periods of the table
- Classes of the table
- Group characteristics

1.2 Environmental compliance personnel shall demonstrate a familiarity level knowledge of chemical bonding and chemical reactions.

Supporting Knowledge and/or Skills

a. Discuss the following types of chemical bonds:

- Ionic
- Covalent
- Metallic

b. Explain each of the following as they relate to the basic laws of chemical reactions:

- The Law of Conservation of Mass
- The Law of Definite Proportions
- The Law of Multiple Proportions

c. Discuss how elements combine to form chemical compounds.

d. Discuss the following terms:

- Mixture
- Solvent
- Solubility
- Solute
- Solution
- Equilibrium

e. With regard to chemical reactions, explain Le Chatelier's principle.

f. Discuss the following terms:

- Density
- Molarity
- Parts per million (ppm)

g. Given an unbalanced chemical equation, explain how to balance the equation.

h. Define the following terms:
- Acid
- Base
- pOH
- Salt
- pH

1.3 Environmental compliance personnel shall demonstrate a familiarity level knowledge of corrosion and water treatment.

Supporting Knowledge and/or Skills

a. Explain the process of general corrosion of iron and steel when exposed to water.

b. Discuss two conditions that can cause galvanic corrosion.

c. Discuss the following types of specialized corrosion:

- Pitting corrosion
- Stress corrosion cracking
- Crevice corrosion

d. Explain the following water treatment processes:

- Ion exchange
- pH adjustment
- Clarification
- Solids handling

1.4 Environmental compliance personnel shall demonstrate a familiarity level knowledge of the fundamentals of chemical safety.

Supporting Knowledge and/or Skills

a. Discuss the hazards associated with the use of corrosives (acids and alkalies).

b. Describe the general safety precautions necessary for the handling, storage, and disposal of corrosives.

c. Discuss the general safety precautions regarding toxic compounds.

d. Describe the criteria used to determine if a compound is a health hazard and discuss the methods by which toxic compounds may enter the body.

e. Discuss the general safety precautions regarding the use, handling, and storage of compressed gases, specifically including: hydrogen, oxygen, and nitrogen.

f. Discuss the safety precautions for working with cryogenic liquids.

g. Explain the difference between a flammable material and a combustible material.

h. Describe the general safety precautions regarding the use, handling, and storage of flammable and combustible materials.

1.5 Environmental compliance personnel shall demonstrate a familiarity level knowledge of piping and instrumentation drawings (P&ID).

Supporting Knowledge and/or Skills

a. Identify the symbols used on engineering piping and instrumentation drawings for:

- Types of valves
- Types of valve operators
- Types of eductors and ejectors
- Basic types of instrumentation
- Types of system components (pumps, etc.)
- Types of lines

b. Identify the symbols used on engineering piping and instrumentation drawings to denote the location of instruments, indicators, and controllers.

c. Determine system flowpaths for a given valve lineup.

1.6 Environmental compliance personnel shall demonstrate a familiarity level knowledge of solving probability and simple statistics problems.

Supporting Knowledge and/or Skills

a. State the definition of the following statistical terms:

- Mean
- Median
- Mode

- Variance
- Mean variance
- Standard deviation

b. Explain the structure of a normal distribution.

c. Describe the structure of a log normal distribution.

d. Calculate the mean of a given set of data.

e. Calculate the mean variance of a given set of data.

f. Given the data, calculate the probability of an event.

1.7 Environmental compliance personnel shall demonstrate a familiarity level knowledge of converting between English and SI system units of measurement.

Supporting Knowledge and/or Skills

a. Define the three fundamental dimensions: length, mass, and time.

b. List standard units of the fundamental dimensions for each of the following systems:

- International System of Units (SI)
- English system

c. Differentiate between fundamental and derived measurements.

d. Given appropriate conversion tables, convert between English and SI units of length.

e. Given appropriate conversion tables, convert between English and SI units of mass.

1.8 Environmental compliance personnel shall demonstrate a familiarity level knowledge of force to geophysical properties.

Supporting Knowledge and/or Skills

a. Define the following:

- Force
- Weight

b. Define the following:

- Tensile force
- Compressive force
- Frictional force

c. Explain the difference between a static-friction force and a kinetic-friction force.

d. State two factors that affect the magnitude of the friction force.

1.9 Environmental compliance personnel shall demonstrate a familiarity level knowledge of the principles and concepts of soil science.

Supporting Knowledge and/or Skills

a. List the different soil compositions and soil structures.

b. Define humus and explain its role in chemical reactions in the soil.

c. Define erosion (water and wind).

d. Describe the following processes and explain how water and soil interact in each:

- Infiltration and percolation
- Groundwater recharge
- Run-off
- Evapotranspiration
- Unsaturated flow

e. Describe how soil characteristics, slope factors, and land cover conditions impact the detachment and transport processes of pollution.

f. Discuss pollutant loading and the pollutant delivery ratio.

g. Discuss the use of soil survey maps.

h. Discuss the cation and anion exchange capacity of soils.

1.10 Environmental compliance personnel shall demonstrate a familiarity level knowledge of the basic principles and concepts of hydrology.

Supporting Knowledge and/or Skills

a. Define hydrology.

b. Describe the hydrologic cycle.

c. Define the following hydrologic terms and describe the relationships between them:

- Precipitation
- Stream flow
- Evaporation
- Transpiration
- Subsurface water
- Sedimentation

d. Define the following groundwater terms and describe the relationships between them:

- Capillary water
- Zone of saturation
- Specific yield
- Hydraulic conductivity
- Transmissivity
- Vadose zone

e. Define the following surface water terms:

- Mass curve
- Frequency analysis

1.11 Environmental compliance personnel shall demonstrate a familiarity level knowledge of the basic principles and concepts of geology.

Supporting Knowledge and/or Skills

a. Discuss the composition, identification and properties of the following types of rocks:

- Igneous
- Sedimentary
- Metamorphic

b. Describe the geometry and properties of the following rock masses:

- Folds
- Faults
- Structural discontinuities
- Shear strength of discontinuities
- Residual stress
- Sheet joints

c. Discuss the use of geological and geotechnical maps.

d. Describe the geologic considerations, criteria and procedures used to evaluate the following areas of topography:

- Relief
- Slope stability
- Flood plains
- Karst terrain

e. Discuss weathering and its significance in geotechnical engineering.

f. Discuss tests that assess weatherability.

g. Discuss the process for logging rock cores.

1.12 Environmental compliance personnel shall demonstrate a familiarity level knowledge of the basic principles and concepts of meteorology.

Supporting Knowledge and/or Skills

a. Discuss the properties of high pressure and low pressure systems and their impact on air pollution.

b. Describe the following horizontal dispersion terms:

- Wind rose
- Pollution rose/plume meander

c. Describe the role of lapse rate in determining dispersion coefficients.

- Dry adiabatic lapse rate
- Prevailing lapse rate
- Neutral lapse rate
- Subadiabatic lapse rate
- Weak lapse rate
- Inversion
- Superadiabatic lapse rate

d. Describe the classes of atmospheric stability, including inversions.

e. Describe information given by a wind rose and a pollution rose.

1.13 Environmental compliance personnel shall demonstrate a familiarity level knowledge of the basic terms and concepts of environmental biology.

Supporting Knowledge and/or Skills

a. Define the following terms:

- Ecosystem
- Habitat
- Species
- Pathways analysis
- Bioaccumulation
- Bioconcentration
- Biotoxicity
- Biodiversity

b. Discuss how synergism makes it difficult to establish a cause/effect relationship between pollutants and disease.

1.14 Environmental compliance personnel shall demonstrate a familiarity level knowledge of the purpose and uses of environmental sampling and monitoring equipment.

Supporting Knowledge and/or Skills

a. Explain the reason for measuring emissions, meteorological factors and ambient air quality under the various operating conditions (e.g., routine or emergency).

b. Describe the purpose and limitations of the following air quality measurement instruments:

- High volume particulate sampler
- Liquid bubbler (e.g., for sulphur dioxide)
- Infrared spectrometer

c. Describe the purpose and types of material collected by the following sampling media:

- High-efficiency glass fiber filter
- Activated charcoal cartridge
- Silica gel

d. Describe the purpose for measuring each of the following parameters during field surveys of water quality:

- Temperature
- Dissolved oxygen
- Conductivity
- pH

e. Discuss the factors that can affect readings and the preservation methods for the field measurements listed above.

f. Describe how trace toxic organics in water are assayed by gas chromatography.

g. Describe how heavy metals in water are measured using atomic absorption spectrophotometry.

h. Describe how volatile organics are measured.

1.15 Environmental compliance personnel shall demonstrate a familiarity level knowledge of basic thermodynamic properties and measurements.

Supporting Knowledge and/or Skills

a. Define the following terms:

- Specific volume
- Density
- Specific gravity
- Mass
- Weight

b. Describe the thermodynamic properties of temperature and pressure.

c. Compare and contrast the Fahrenheit, Celsius, Kelvin, and Rankine temperature scales, and discuss the concept of absolute zero.

d. Describe the relationship between absolute pressure, gauge pressure, and vacuum.

1.16 Environmental compliance personnel shall demonstrate a familiarity level knowledge of fluid flow concepts and theories.

Supporting Knowledge and/or Skills

a. Using the ideal gas law discuss the relationship between pressure, temperature, and volume.

b. Describe the effects of pressure and temperature changes on confined fluids.

c. Describe how the density of a fluid varies with temperature.

d. Describe the relationship between the pressure in a fluid column and the density and depth of the fluid.

e. Define the property of viscosity.

f. Define the terms "head," "head loss," and "frictional loss," with respect to their use in fluid flow.

2. REGULATORY

NOTE: When Department of Energy directives are referenced in the qualification standard, the most recent revision should be used.

Environmental compliance personnel may specialize in one or more of the following five disciplines: Air; Water; Waste Management; National Environmental Policy Act (NEPA); or, Environmental Radiation. Due to this specialized nature of the Environmental Compliance Functional Area, environmental compliance personnel shall complete one or more of the first five competency statements (2.1 - 2.5). The competency statements correspond to the five disciplines: Air; Water; Waste Management; National Environmental Policy Act; or, Environmental Radiation. The specific competency statement(s) to be completed will be determined by line management. The remaining competency statements (2.6 - 2.9) shall be completed by all environmental compliance personnel.

2.1 Environmental compliance personnel shall demonstrate a working level knowledge of the Clean Air Act (CAA) and implementing regulations.

Supporting Knowledge and/or Skills

a. Discuss the application of the Clean Air Act to the Department of Energy or its facilities.

b. Identify the National Ambient Air Quality Standards (primary and secondary) and the National Emission Standards for Hazardous Air Pollutants (NESHAP).

c. Describe the requirements for permitting, monitoring and reporting prescribed in the regulations that implement Title V of the Clean Air Act.

d. Describe the prevention of significant deterioration (PSD) regarding the requirements established by the Clean Air Act.

e. Discuss the modeling requirements for monitoring and close calculation air dispersion in the National Emissions Standards for Hazardous Air Pollutants, Standards for Radionuclides.

f. Identify the major sources and emission limitations per the Clean Air Act, Title I.

g. Discuss the New Source Performance Standards (40 CFR 60).

h. Discuss the potential liabilities of the Department of Energy and its contractors inherent in the enforcement of environmental regulations (i.e., compliance orders, enforcement actions, fines and penalties, and provisions for civil suits).

i. Discuss the National Emissions Standards for Hazardous Air Pollutants air emission limits.

j. Describe the Clean Air Act, Title V, Stratospheric Ozone Protection criteria.

k. Discuss the requirements for control technologies specified in the Clean Air Act and the purpose and function of various air pollutant abatement technologies.

l. Describe the four basic classes of air pollutant abatement/control technologies specified in the Clean Air Act.

m. Describe, in general, the purpose and function of various pollution abatement equipment/technologies.

- Cyclones
- Baghouse
- Electrostatic precipitator
- Thermal oxidizer
- Scrubber
- Adsorption

2.2 Environmental compliance personnel shall demonstrate a working level knowledge of the following laws and regulations as related to the environmental medium of water:

- **Clean Water Act (CWA)**
- **Safe Drinking Water Act (SDWA)**
- **Resource Conservation and Recovery Act (RCRA) (groundwater provisions)**
- **National Groundwater Protection Policy (NGPP)**
- **Oil Pollution Act**
- **Rivers and Harbors Act (RHA)**

Supporting Knowledge and/or Skills

a. Discuss the application of the above laws and regulations to the Department of Energy and its facilities.

b. Describe water quality criteria and stream use classification identified in the Clean Water Act.

c. Discuss the Clean Water Act permitting requirements including monitoring and reporting. Include in the discussion, National Pollutant Discharge Elimination System Program and the Rivers and Harbors Act Dredge/Fill material permits.

d. Describe the reporting requirements identified in the Clean Water Act.

e. Discuss the standards for maximum contaminant levels (primary and secondary) contained in the Safe Drinking Water Act.

f. Describe the provisions for notification to consumers as outlined by the Safe Drinking Water Act.

g. Discuss the Safe Drinking Water Act Underground Injection Control Program.

h. Describe the standard methods for the examination of water and wastewater.

i. Discuss the Safe Drinking Water Act permitting requirements.

j. Describe the aquifer protection (sole source) regulations of the Safe Drinking Water Act.

k. Discuss the cross-connection identification/elimination and back-flow prevention regulations described in the Safe Drinking Water Act.

l. Describe the groundwater protection requirements applicable to interim status Resource Conservation and Recovery Act's (RCRA) facilities in RCRA's implementing regulations, Subpart F of 40 CFR 265.

m. Describe the groundwater protection requirements applicable to permitted Resource Conservation and Recovery Act (RCRA) facilities in RCRA's implementing regulations, Subpart F of 40 CFR 264 and in the facility's permit.

n. Discuss the potential liabilities of the Department of Energy and its contractors inherent in the enforcement of environmental regulations (i.e., compliance orders, enforcement actions, fines and penalties, and provisions for civil suits).

o. Discuss the storm water management aspects of the National Pollutant Discharge Elimination Standard (NPDES).

p. Describe the radiological liquid effluent requirements established in DOE Order 5400.5, Radiation Protection of the Public and the Environment, and 10 CFR Part 834, Radiation Protection of the Public and Environment.

q. Explain the spill prevention and control requirements of the Clean Water Act (40 CFR 109-114).

2.3 Environmental compliance personnel shall demonstrate a working level knowledge of the following laws, regulations, and Department of Energy (DOE) Order as related to Environmental Waste Management:

- **Resource Conservation and Recovery Act (RCRA)**
- **Hazardous Materials Transportation Act (HMTA)**
- **DOE Order 5820.2A, Radioactive Waste Management**
- **Toxic Substances Control Act (TSCA)**

Supporting Knowledge and/or Skills

a. Discuss the application of the above regulations to the Department of Energy and its facilities.

b. Describe the relationship of the Hazardous Materials Transportation Act (49 CFR Parts 170-179) to the Resource Conservation and Recovery Act transportation regulations (40 CFR Part 263).

c. Discuss the relationship of DOE Order 5820.2A, Radioactive Waste Management, to the Resource Conservation and Recovery Act.

d. Explain the relationship between the Resource Conservation and Recovery Act and the Federal Facilities Compliance Act (FFCA). Include in your discussion the development of Site Treatment Plans and development of Waste Treatment Technologies.

e. Describe the types of facilities that need Resource Conservation and Recovery Act permits; list differences between a RCRA Part A and a RCRA Part B permit application; and give examples of RCRA Part B permit application requirements that apply to all facilities and those that apply to specific types of facilities.

f. Describe how to determine if a material is a solid waste. Given a material that is a solid waste, describe how to determine if it is a hazardous or a mixed waste.

g. Discuss the Land Disposal Restrictions, including the different types of treatment standards, the dilution prohibition, the storage prohibition, and different types of variances and exemptions.

h. Discuss the regulatory requirements applicable to Federal facility solid waste landfills (including Resource Conservation and Recovery Act Subtitle D).

i. Describe the different classes of hazardous waste generators and their responsibilities with respect to manifesting, packaging, labeling, marketing, and placarding in accordance with Department of Transportation (DOT) requirements; and biennial reporting.

j. Discuss the Personal Protective Equipment (PPE) requirements for work activities in hazardous areas.

k. Discuss the potential liabilities of the Department of Energy and its contractors inherent in the enforcement of environmental regulations (i.e., compliance orders, enforcement actions, fines and penalties, and provisions for civil suits).

l. Discuss the requirements identified in DOE Order 5820.2A, Radioactive Waste Management, for the following types of waste:

- Low-level
- High-level
- Transuranic

m. Discuss the waste management requirements for polychlorinated biphenyls (PCBs) outlined by the Toxic Substances Control Act (TSCA).

n. Discuss the Resource Conservation and Recovery Act underground storage tank regulations (Subtitle I).

2.4 Environmental compliance personnel shall demonstrate a working level knowledge of the implementation of the regulations and requirements of the National Environmental Policy Act (NEPA).

Supporting Knowledge and/or Skills

a. Explain the purpose and scope of the Council on Environmental Quality regulations implementing the National Environmental Policy Act (40 CFR 1500-1508).

b. Discuss the purpose and scope of DOE Order 5440.1E, National Environmental Policy Act Compliance Program.

c. Describe the public participation process.

d. Discuss the integration of consultation requirements under other environmental legislation (e.g., National Environmental Policy Act and Endangered Species Act and Fish and Wildlife Coordination Act).

e. Discuss the content and procedures specified by the Department implementing regulations 10 CFR 1021, Compliance with the National Environmental Policy Act and Secretarial Policy on the National Environmental Policy, June 13, 1994.

f. Participate in the preparation of the documents listed below.

- Environmental Impact Statement (EIS)
- Environmental Assessment (EA)
- Finding Of No Significant Impact (FONSI)
- Categorical Exclusion (CX)
- Record of Decision (ROD)

g. Discuss the potential liabilities of the Department and its contractors inherent in the enforcement of environmental regulations (i.e., compliance orders, enforcement actions, fines and penalties, and provisions for civil suits).

2.5 Environmental compliance personnel shall demonstrate a working level knowledge of the following laws, regulations, and Department of Energy Orders as related to environmental radiation:

- **Atomic Energy Act**
- **10 CFR 834, Radiation Protection of the Public and Environment**
- **40 CFR 61 Subpart H, National Emission Standards for Hazardous Air Pollutants**
- **40 CFR 141, National Primary Drinking Water Regulations**
- **DOE Order 5400.1, General Environmental Protection Program**
- **DOE Order 5400.5, Radiation Protection of the Public and the Environment**
- **DOE Order 5820.2A, Radioactive Waste Management**
- **40 CFR 122, EPA Administered Permit Programs: The National Pollutant Discharge Elimination System**

Supporting Knowledge and/or Skills

a. Discuss the application of the above listed documents to the Department of Energy and its facilities.

b. Define the following terms and their implications for regulation in the Department of Energy:

- Source material

- Special nuclear material
- Byproduct material
- Naturally occurring or accelerator-produced radioactive material

c. Describe the major requirements of 10 CFR 834, Radiation Protection of the Public and Environment.

d. Describe the concept of Reportable Quantity and identify that quantity for a given radionuclide.

e. Describe the system for classifying mixed waste and the general requirements for treatment, storage and disposal.

f. Describe the basic monitoring and reporting requirements of radionuclides in National Emissions Standards for Hazardous Air Pollutants and state the dose limit.

g. Describe the basic limits for radionuclides in drinking water and their application to Department operations.

h. Describe the following types of radioactive waste and the associated requirements:

- Low-level waste
- High-level waste
- Transuranic waste
- Spent nuclear fuel
- Uranium mine and mill tailings

i. Discuss the potential liabilities of the Department and its contractors inherent in the enforcement of environmental regulations (i.e., compliance orders, enforcement actions, fines and penalties, and provisions for civil suits).

2.6 Environmental compliance personnel shall demonstrate a working level knowledge of the supporting environmental laws and regulations including:

- **Pollution Prevention Act (PPA)**
- **Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)**
- **Toxic Substances Control Act (TSCA)**
- **Endangered Species Act (ESA)**
- **Comprehensive Environmental Response, Compensation & Liability Act/Superfund Amendments and Reauthorization Act (Superfund)**
- **Emergency Planning and Community Right-to-Know Act (EPCRA)**
- **Atomic Energy Act**
- **Federal Facilities Compliance Act (FFCA)**

Supporting Knowledge and/or Skills

a. Describe the deadlines identified in the Pollution Prevention Act.

b. Identify the disciplines/areas in which Pollution Prevention Act applies.

c. Describe the process for licensing applicators as defined in the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA).

d. Discuss the purpose and history of Comprehensive Environmental Response, Compensation, and Liability Act/Superfund Amendments and Reauthorization Act (Superfund).

e. Explain how the Reportable Quantities (RQ) specified by Comprehensive Environmental Response, Compensation, and Liability Act are applied.

f. Describe the removal/cleanup actions required by Comprehensive Environmental Response, Compensation, and Liability Act/Resource Conservation and Recovery Act.

g. Discuss the interface/coordination with Environmental Restoration efforts required by Comprehensive Environmental Response, Compensation, and Liability Act/Resource Conservation and Recovery Act.

h. Describe the application of the Emergency Planning and Community Right-to-Know Act to Department facilities (e.g., Toxic Release Inventory and coordination requirements with local emergency planning committees).

i. Describe the following types of waste defined by the Atomic Energy Act:

   - High level
   - Transuranic
   - Low level
   - By-product material
   - Special nuclear material
   - Source material

j. Discuss the Endangered Species Act consultation requirements.

k. Discuss the marking of PCS and PCB items required by the Toxic Substances Control Act.

l. Describe how the Federal Facilities Compliance Act will impact Department compliance actions.

2.7 Environmental compliance personnel shall demonstrate a working level knowledge of the following Department of Energy (DOE) Orders:

- **DOE Order 5400.1, General Environmental Protection Program**
- **DOE Order 5400.2A, Environmental Compliance Issue Coordination**

Supporting Knowledge and/or Skills

a. Discuss the relationship between Comprehensive Environmental Response, Compensation, and Liability Act and DOE Order 5400.1, General Environmental Protection Program.

b. Describe the requirements, deadlines and update frequency for the following Plans mandated by DOE Order 5400.1, General Environmental Protection Program:

- Environmental Protection Implementation Plan
- Groundwater Protection Management Program
- Long-range Environmental Protection Plan
- Waste Minimization Plan
- Pollution Prevention Program
- Environmental Monitoring Plan
- Pollution Abatement Projects 5-year Plan

c. Explain the Environmental Compliance Issue Coordination and Reporting outlined in DOE Order 5400.2, Environmental Compliance Issue Coordination.

2.8 Environmental compliance personnel shall demonstrate a working level knowledge of the management and negotiation of regulatory agreements and permits.

Supporting Knowledge and/or Skills

a. Describe the responsibilities involved with the management of the following documents:

- National Pollutant Discharge Elimination System Permit
- Federal Facility Agreement
- Consent Orders & Settlement Agreements
- Record Of Decision

- Resource Conservation and Recovery Act Part B Permit
- Grant conditions

b. Discuss the requirements and methods of negotiation for the following documents:

- National Pollutant Discharge Elimination System Permit
- Federal Facility Agreement
- Consent Order & Settlement Agreements
- Record Of Decision
- Resource Conservation and Recovery Act Part B Permit
- Grant conditions

2.9 Environmental compliance personnel shall demonstrate a familiarity level knowledge of how environmental laws and regulations are enforced.

Supporting Knowledge and/or Skills

a. Discuss the interrelationship between the following:

- Environmental law
- Statutory construction
- The United States Code
- The Code of Federal Regulations
- State Laws and Regulations

b. Describe the organization, mission, and enforcement authorities of the Environmental Protection Agency (EPA).

c. Discuss the role of the Department's legal counsel in environmental compliance activities.

d. Discuss the enforcement of environmental statutes under civil and criminal authorities.

e. Describe the Executive Orders pertaining to environmental protection and compliance.

3. ADMINISTRATIVE

NOTE: When Department of Energy directives are referenced in the qualification standard, the most recent revision should be used.

3.1 Environmental compliance personnel shall demonstrate a working level knowledge of communication methods used with Headquarters, Field elements, regulatory agencies, the public, and other stakeholders.

Supporting Knowledge and/or Skills

a. Describe the Department's organization and discuss the Department's procedures for communicating between elements.

b. Describe the Department's procedures and policy for communicating with the Environmental Protection Agency and other regulatory agencies.

c. Demonstrate the ability to present technical ideas in general terms to the public.

d. Define conflict and discuss the win-lose and win-win methods of conflict resolution.

3.2 Environmental compliance personnel shall demonstrate a working level knowledge of the requirements for managing environmental compliance data.

Supporting Knowledge and/or Skills

a. Describe the relationship of the following documents to the data management requirements of environmental compliance:

- DOE Order 5700.6C, Quality Assurance
- NQA-1, Quality Assurance Program Requirements for Nuclear Facilities
- DOE Order 1324.2A, Records Disposition
- DOE Order 5400.5, Radiation Protection of the Public and the Environment
- DOE Order 1330.1D, Computer Software Management

b. Describe the quality assurance requirements for monitoring radiological air emissions specified in the National Emissions Standards for Hazardous Air Pollutants.

c. Describe the Mean Relative Difference (MRD) statistical evaluations required by the Quality Assessment Program (QAP) for Department Laboratories. Include in your discussion the purpose of the three types of evaluations (duplicate, blind-sample, and split-sample) performed.

d. Describe the program administered by the Environmental Protection Agency Environmental Monitoring System Laboratory-Las Vegas for quality control of environmental radiological measurements.

e. Describe the program administered by the Department's Environmental Measurements Laboratory to assess the quality of environmental data reported to the Department.

4. MANAGEMENT, ASSESSMENT, AND OVERSIGHT

NOTE: When Department of Energy directives are referenced in the qualification standard, the most recent revision should be used.

Due to the specialized nature of the Environmental Compliance Functional Area, environmental compliance personnel shall complete one or more of the first four competency statements (4.1 - 4.4). The competency statements correspond to the disciplines: Air; Water; Waste Management; or, Environmental Radiation. The specific competency statement(s) to be completed will be determined by line management. The remaining competency statements (4.5 - 4.15) shall be completed by all environmental compliance personnel.

4.1 Environmental compliance personnel shall demonstrate the ability to appraise the contractor's program(s) and/or permits to assess compliance with the requirements for the environmental medium of air.

Supporting Knowledge and/or Skills

a. Given a proposed permit application, evaluate the requirements, including monitoring and reporting, established by the regulations that implement the Clean Air Act.

b. Given an existing or proposed permit application, verify compliance with requirements in the regulations that implement the Clean Air Act for the prevention of significant deterioration (PSD).

c. Given a permitted source, conduct an assessment to verify compliance with the emission limitations per the Clean Air Act, Title I.

d. Given a proposed permit, verify that the administrative controls are in place/planned to establish acceptable limits of air quality.

e. Given an air permit or a permit application, evaluate the source against the operating conditions in the permit or the permit application.

f. Given an existing permitted source, evaluate the source's future operating requirements in terms of the constraints imposed by their current permit.

g. Given a proposed source, evaluate the source for all present applicable Federal and state regulations.

h. Conduct an appraisal to assess compliance with polychlorinated biphenyls (PCB) waste management activities according to the Toxic Substances Compliance Act (TSCA).

4.2 Environmental compliance personnel shall demonstrate the ability to appraise the contractor's program(s) and/or permits to assess compliance with the requirements for the environmental medium of water.

Supporting Knowledge and/or Skills

a. Given a proposed permit, verify that the Water Quality Criteria and Stream Use Classification as identified in the Clean Water Act has been correctly applied.

b. Review the contractor's program for compliance with the Clean Water Act's reporting requirements.

c. During an assessment of an existing facility, verify that the pre-treatment standards contained in the Clean Water Act are being met.

d. During an assessment of the contractor's sampling and monitoring program, verify that the standards for maximum contaminant levels (primary and secondary) provided by the Safe Drinking Water Act are being met.

e. Conduct an assessment of the contractor's program to verify that the Safe Drinking Water Act provisions for notification to consumers have been established.

f. Perform an assessment of underground injection procedures and monitoring, and assess for compliance with the restrictions and controls provided by the Safe Drinking Water Act.

g. Conduct an assessment to ensure the contractor's program is in compliance with the Standard Methods for the examination of water and wastewater or other acceptable protocol as detailed in 40 CFR 136, Analytical Test Procedures.

h. Review the contractor's program(s) for adequate provisions to ensure that the cross-connection identification/elimination and back-flow prevention is as described by the Safe Drinking Water Act.

i. Prior to closure of a permit, review it for compliance with the Resource Conservation and Recovery Act requirements for groundwater protection.

4.3 Environmental compliance personnel shall demonstrate the ability to appraise the contractor's program(s) and/or permits to assess compliance with the requirements for Environmental Waste Management.

Supporting Knowledge and/or Skills

a. Given a proposed permit application, evaluate it for compliance with the Resource Conservation and Recovery Act requirements.

b. Assess the contractor's plans and procedures for hazardous waste generation to ensure compliance with the Resource Conservation and Recovery Act land disposal and landfill restrictions.

c. Assess the contractor's plans and procedures for a hazardous waste storage and disposal are to ensure compliance with the Resource Conservation and Recovery Act land disposal and landfill restrictions.

d. Assess the contractor's plans and procedures for compliance with the Resource Conservation and Recovery Act non-hazardous solid waste disposal regulations.

e. Assess to determine whether Resource Conservation and Recovery Act regulated site waste goes to on-site or off-site Resource Conservation and Recovery Act permitted landfills.

f. For a given activity in a hazardous area, identify the personal protective equipment (PPE) requirements.

g. Given a type of personal protective equipment, demonstrate the proper use (donning and doffing) of the equipment.

4.4 Environmental compliance personnel shall demonstrate the ability to appraise the contractor's program(s) to assess compliance with the requirements for environmental radiation protection.

Supporting Knowledge and/or Skills

a. Assess whether the effluent monitoring from a facility meets the requirements of DOE Order 5400.5, Radiation Protection of the Public and the Environment, 10 CFR 834, Radiation Protection of the Public and Environment, and DOE/EH-0173T, Environmental Regulatory Guide for Effluent Monitoring and Environmental Surveillance.

b. Assess whether adequate methods are used to characterize effluents for purposes of limiting doses to the public in accordance with regulatory and "as low as reasonably achievable (ALARA)" limits.

c. Assess whether the Environmental Radiological Protection Program is in accordance with 10 CFR 834, Radiation Protection of the Public and Environment.

4.5 Environmental compliance personnel shall demonstrate the ability to review and assess the following National Environmental Policy Act documentation:

- **Environmental Impact Statement (EIS)**
- **Environmental Assessment (EA)**
- **Finding Of No Significant Impact (FONSI)**
- **Categorical Exclusion (CX)**
- **Record of Decision (ROD)**

Supporting Knowledge and/or Skills

a. Discuss the requirements for each document and describe the process for reviewing the above listed documents.

b. Describe the process for performing an assessment of the above listed documents and discuss criteria that could be used during an assessment.

c. Perform a written review/assessment of each of the above listed documents.

d. Discuss the relationship between 40 CFR 1500, Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act, and DOE Order 5440.1E, National Environmental Policy Act Compliance Program.

4.6 Environmental compliance personnel shall demonstrate a familiarity level knowledge of evaluating technologies.

Supporting Knowledge and/or Skills

a. Discuss the Department's policies and procedures for screening technologies.

b. Describe the process for performing an analysis of alternative Environmental Compliance options.

4.7 Environmental compliance personnel shall demonstrate a familiarity level knowledge of the structure of the Environmental Management (EM) organization and other organizations related to environmental compliance.

Supporting Knowledge and/or Skills

a. Given a current Environmental Management organizational chart, explain the relationship between the organizational elements and describe the functions of each element.

b. Given a current Department organizational chart, explain the relationships between Departmental elements with respect to environmental compliance.

c. List other Federal agencies, including regulatory agencies, and/or sub-elements of those agencies that play a role, both technological and regulatory, in the environmental compliance at Department sites and describe their role(s).

4.8 Environmental compliance personnel shall demonstrate a familiarity level knowledge of program and project management as described in Department of Energy (DOE) Order 4700.1, Project Management System, and Department of Energy (DOE) Technical Standard, DOE-STD-1073-93, Guide for Operational Configuration Management.

Supporting Knowledge and/or Skills

a. Explain the purpose of project management.

b. Describe the life cycle of a typical project.

c. Describe typical documents and data sources utilized in project management.

d. Identify and explain the major elements of a project, and discuss their relationships.

e. Describe the purpose of schedules, and discuss the use of milestones and activities.

f. Describe the requirements for project/program files and documentation.

g. Explain the project manager's role in relationship to the contractor and environmental compliance personnel.

4.9 Environmental compliance personnel shall demonstrate a working level knowledge of contract management to assess contractor performance and ensure accountability.

Supporting Knowledge and/or Skills

a. Discuss the purpose of contracting as it pertains to the operations of Department facilities.

b. Explain the types of contracts employed by the Department.

c. Describe the characteristics of the three major contract types utilized within the Department.

d. Describe the "Accountability Rule," and discuss the role it plays in contract management.

e. Discuss the roles of Federal and contractor personnel in contract management.

f. Define the term "Federal Norm," and describe its significance to Department and contractor activities.

g. Describe the DOE Order 5480.29, Employee Concerns Program, and the role of environmental compliance personnel.

4.10 Environmental compliance personnel shall demonstrate a working level knowledge of contract management to establish contractor evaluation requirements and assess contractor performance.

Supporting Knowledge and/or Skills

a. Discuss the "Cost Plus Award Fee" evaluation process, including development of performance criteria, conduct of the evaluation, and documentation and transmittal requirements for performance.

b. Discuss the typical areas for criteria, performance measures, and means to communicate importance of the area in the contractor evaluation Performance Criteria.

c. Participate in an actual contractor evaluation performance cycle.

4.11 Environmental compliance personnel shall demonstrate a familiarity level knowledge of communications when working or interacting with the contractor, media, stakeholders, and other internal and external organizations.

Supporting Knowledge and/or Skills

a. Discuss the purpose of the following Department of Energy Orders, and describe the associated roles and responsibilities of environmental compliance personnel:

- DOE Order 5500.4A, Public Affairs Policy and Planning Requirements for Emergencies

- DOE Order 1700.1, Freedom of Information Program

b. Identify the various internal and external groups with which the environmental compliance personnel must interface to perform assigned duties.

c. Describe the Public Participation Policy and the role of the Public Participation Officer.

4.12 Environmental compliance personnel shall demonstrate a working level knowledge of facility performance assessment, including assessment techniques (such as observations, interviews, and document reviews), reporting results, and following-up on action(s) taken.

Supporting Knowledge and/or Skills

a. Describe the environmental compliance personnel's role in the of oversight of Government-Owned Contractor Operated (GOCO) facilities.

b. Describe the assessment requirements and limitations associated with the environmental compliance personnel's interface with contractor employees.

c. Explain the essential elements of a performance-based assessment including the areas of investigation, fact finding, and reporting.

d. Describe the contents of an assessment report.

e. Explain the essential elements and processes associated with the following assessment activities:

- Exit interviews
- Closure process
- Tracking to closure
- Follow up
- Contractor corrective action implementation

f. Participate in formal meetings between Department management and senior contractor management to discuss results of environmental compliance assessments.

4.13 Environmental compliance personnel shall demonstrate a working level knowledge of monitoring techniques related to environmental compliance.

Supporting Knowledge and/or Skills

a. Describe the types of equipment used to monitor a site for the following:

- Ambient air quality
- Emissions
- Groundwater contamination
- Meteorological factors
- Streams and rivers contamination
- Soil and sediment contamination
- Wildlife contamination

b. Describe the requirements of the following documents as they relate to environmental monitoring:

- 10 CFR 61.53, Environmental Monitoring
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
- Resource Conservation and Recovery Act (RCRA)
- National Environmental Policy Act (NEPA)
- 40 CFR 136, Analytical Test Procedures

c. Describe the various quality assurance and quality control programs used to enhance data quality. Include in your discussion programs both internal and external to the Department.

d. Given a sampling parameter/equipment, describe the standard sampling methods and protocols.

4.14 Environmental compliance personnel shall demonstrate a working level knowledge of the principles, concepts, and requirements of an environmental risk assessment.

Supporting Knowledge and/or Skills

a. Define risk assessment, risk management, and risk communication.

b. Describe the four steps of a risk assessment.

c. Discuss the part risk assessment plays in the following:

- Pre-remedial program
- Removal program
- Remedial program

d. Describe how risk assessment helps in site decision-making.

e. Define the term "baseline risk assessment."

f. Describe the process for performing a toxicity assessment.

g. Describe the process for performing an exposure assessment.

h. Describe the process used to characterize risk.

i. Describe methods for performing pathway modeling. Include in the discussion the advantages and disadvantages of each method.

j. Perform an environmental risk assessment.

4.15 Environmental compliance personnel shall demonstrate a working level knowledge of problem analysis principles and techniques necessary to identify problems, potential causes of the problems, and corrective action(s); as described in Department of Energy (DOE) Order 4010.1, Value Engineering, and Office of Management and Budget (OMB) Circular A-131.

Supporting Knowledge and/or Skills

a. Describe and explain the application of problem analysis techniques including the following:

- Root Cause Analysis
- Causal Factor Analysis
- Change Analysis
- Barrier Analysis
- Management Oversight Risk Tree Analysis

b. Describe and explain the application of the following Root Cause Analysis processes in the performance of occurrence investigations:

- Events and Causal Factors Charting
- Root Cause Coding
- Recommendation Generation

c. Describe the following types of investigations and discuss an example of the application of each:

- Type A
- Type B

- Type C

EVALUATION REQUIREMENTS

The following requirements shall be met to complete the Department-wide Environmental Compliance Functional Area Qualification Standard. The evaluation process identified below serves as a measurement tool for assessing whether the participants have acquired the technical competencies outlined in this Standard.

1. Documented completion of the Department-wide General Technical Base Qualification Standard in accordance with the requirements contained in that standard.

2. Documented completion of the competency requirements listed in this Functional Area Qualification Standard. Documentation of the successful completion of these competency requirements may be satisfied by a qualifying official using any of the following methods:

   - Documented evaluation of equivalencies
   - Written examination
   - Documented oral evaluation
   - Documented observation of performance

CONTINUING TRAINING AND PROFICIENCY REQUIREMENTS

Environmental compliance personnel shall participate in an Office/facility/position-specific continuing training and qualification program that includes the following elements:

1. Technical education and/or training covering topics directly related to the duties and responsibilities of environmental compliance personnel as determined by line management. This may include courses and/or training provided by:

   - Department of Energy
   - Other Government agencies
   - Outside vendors
   - Educational institutions

2. Training covering topics that address identified deficiencies in the knowledge and/or skills of environmental compliance personnel.

3. Training in areas added to the Environmental Compliance Functional Area Qualification Standard since initial qualification.

4. Specific continuing training requirements shall be documented in Individual Development Plans (IDPs).